EXAMINING DARWIN'S INFLUENCE ON THE EDUCATION DEBATE IN VICTORIAN ENGLAND

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ABSTRACT

England's reluctance to establish a national system of education throughout the nineteenth century allowed for the continued dominance of religiously controlled classical education which was forced to confront the growing demand for scientific education with Darwin's publication of *The Origin of Species* in 1859. Any move towards a primarily secular education would have significant implications for the Victorian social hierarchy and longstanding aristocratic rule. Consequently, Victorian culture spiraled into a heated debate over the future of education between the classicists, whose resistance was, in part, the result of rising religious tensions with the geological challenge to Genesis, and the scientific community, who argued that a classical education contributed little applicable knowledge for the technological advancement of society. Darwin's publication of *The Origin of Species* added a new dimension of religious controversy to the education debate and redefined the fundamental reasons for the irreconcilable clash between scientists and classicists.

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INTRODUCTION

Constant change and conflicting ideologies defined the Victorian period and sparked a clash between classical knowledge and cultural and scientific progress. England was at the height of its imperial power during the Victorian period, and the Victorians considered themselves to be the ideal standard for high culture, paving the way into a new century characterized by rapid advances in technology and a relentless exploration of the natural world. But the forward tug of modernization and the reluctant lag of classical reminiscence clashed in various sectors of Victorian society and perhaps nowhere as violently as in the arena of education. The Education Question had been brewing in England since the early nineteenth century and now raised the central issue of who in society should be educated and in what manner. New mid-century suffrage legislation finally catalyzed the demand for an answer regarding the ideal means of educating the lower classes. In particular, the passage of the Reform Bills of 1832 and 1867 prompted long pent up change, which began the slow disintegration of the longstanding social hierarchy, traditionally dominated by the classically distinguished upper class, by transferring a significant portion of England's political control to the middle classes. Many were concerned that a newly enfranchised middle class held the fate of English society in their hands but lacked the necessary cultivation of thought and manner required to properly handle political power and maintain the elite Victorian high culture as it had been handed down for centuries. Without the continuation of a primarily liberal education that reinforced the religious justification of the Victorian social order, the

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upper classes began to fear that the delicate threads of society would unravel entirely. Others felt that unless England embraced the future they would fall behind in the race for technological and commercial progress. Thus classicists, led by the wealthy and liberally educated class of gentlemen, fought against scientists, represented by a loose union of inquisitive and religiously discontented minds, to answer the question regarding what manner of education was best in what became known as the Education Debate.

Major scientific advances and the rise of industrialization, neither of which benefitted from the longstanding tradition of liberal education, heightened the discord in Victorian England regarding the future of education. Doing away with the classical standard of education in favor of an unfounded and exploratory scientific education with no regard for religious tradition would, from the perspective of the upper class, inevitably diminish the Victorian perfection of culture. For their part, scientists, invigorated by the implications of Darwin's evolutionary theory and the potential for new discovery, were no longer interested in perpetuating an archaic social order that provided no useful knowledge for the rapidly changing Victorian way of life and thus sought only to further their own understanding of the world within which they lived. In response, the upper classes attempted to maintain the system within which the inspiration for art and poetry was cultivated and resisted a divergence from the classical study of the seven liberal arts, which they regarded as the foundation of culture. The traditional understanding of culture was primarily constructed through the religious principles of Christianity, which Matthew Arnold argued were indispensable to the continuation of a successful society. Standing against this view, Thomas Huxley, the father of agnosticism, countered Arnold and claimed that it was religion which hindered society's forward progress. Huxley argued that the medieval tradition of education

was inextricably entwined in a strictly regulated Christian doctrine while the modern scientific pursuit of knowledge required an irreligious openness of thought. The tension between the tradition of the past and the potential of the future was entangled in a religious disagreement which ultimately resulted in an inability for the scientists and classicists to reach a consensus.

Darwin's publication of *The Origin of Species* in 1859 set the stage for the education debate by revealing the irreconcilable conflict between the Christian faith that had ruled England for centuries and the scientific discoveries of the means by which the natural world existed. This conflict was at the core of the Education Debate, as classicists defended the continued dominance of the traditional liberal education with its inherent religious structure against the scientists' claim that modern science education should serve as the foundation for future education in England. While Darwin himself did not actively participate in the Education Debate, his ideas on evolution and natural selection fundamentally challenged Genesis and the Biblical account of creation, and thus paved the way for a challenge to the Victorian social hierarchy. This thesis examines the interrelatedness of religion, class, and science as interdependent factors in the Victorian education debate and the resulting impasse between scientists and classicists in their efforts to reconcile a unified approach to education. The significant body of existing scholarly research on this topic has thus far overlooked the intricate connections between many of the issues that lie at the root of the education debate. The clash between religion and science is the overwhelming component of the debate and has been thoroughly researched for decades; however, England's difficulty in stabilizing education throughout the nineteenth century and the aristocratic desire to maintain the traditional class structure are necessary for the foundation of the debate and inextricable from

the controversy. Therefore, rather than extrapolating a new interpretation of the issues in the education debate, this thesis proposes new connections between existing scholarship and provides insight into the widespread importance of the debate during the Victorian period.

The first chapter spans the development and reform of education in England, beginning with the passage of the first Factory Act in 1802, and examines the connections between education and class and how the resulting tensions provided the basis for the subsequent debate during the latter part of the Victorian period. The second chapter focuses on the Darwinian debate following the publication of *The Origin of Species* and the implications of Darwin's theory of natural selection for the religious foundations of a liberal education. Finally, the last chapter highlights the Arnold-Huxley debate as the culmination of the education debate and presents a synthesis of the contrasting stances regarding education from additional prominent voices such as John Henry Cardinal Newman and Herbert Spencer. The final chapter will also discuss the religious factors that prevented the arts and sciences from moving forward in a mutual pursuit of knowledge and truth resulting in the formation of a chasm between the two branches that continued to develop throughout the twentieth century.

CHAPTER I

THE EVOLUTION OF EDUCATION IN NINETEENTH CENTURY ENGLAND

The system of public education in place in England at the beginning of the nineteenth century was quite limited when compared to those in Scotland, Germany, or France, which had, by that point, all established some form of national education, while little real progress was made in England until the latter quarter of the century. For most of the nineteenth century, English education was comprised of a system of elite private academies catering to the children of the wealthy upper class; an assortment of hundreds of voluntary public schools run almost entirely by local churches and philanthropic religious groups to provide for the middle class; and a small group of free schools mandated by the government to be provided for by factory and mill owners to educate the children of the working class. Classical liberal tradition dominated education at the private academies and provided the necessary training for one to be deemed a "proper" Victorian gentleman. The middle classes were primarily educated to be literate members of society, and limited educational opportunities largely centered on moral instruction as a means of maintaining social order. What little education the working class children received was almost entirely religious in nature with little emphasis on development of intellect or literacy.

The prevalent curriculum of nineteenth century England was founded upon the ancient Roman categorization of all knowledge into the Seven Liberal Arts: grammar, dialectic (logic), rhetoric, geometry, arithmetic, astronomy, and music (Boyd 94). The first three comprised the Trivium while the remaining four were known as the Quadrivium (Wilson 122). The Seven Liberal Arts were first articulated by Martianus Capella, a Fifth

Century rhetorician, whose initial manuscript was viewed as evidence of a decline in the flourished learning of the Fourth Century (Boyd 93-94). Capella's restriction of knowledge to seven narrow sectors was an obviously artificial construction of boundaries in learning, excluding much of Greek literature and science, yet it provided "a definiteness to the vague conception of 'liberal studies'" as well as a definitive foundation for education that would hold for centuries (Boyd 95).

The birth of the Seven Liberal Arts coincided with the final "ascendancy of Christianity in the Roman Empire" following the murder of Hypatia by a Christian mob (Boyd 94-95). However, with Christianity's rise as the ruling theology, the enthusiasm for learning that had characterized the Fourth Century began to dwindle due to the distrust in the pagan spirit of the old education (Boyd 99). The Church, for its part, felt no concern for the intellectual value of education and only undertook leadership of scholasticism when it became necessary to educate the clergy in order to fulfill religious duties, as church leaders argued that the "ultimate reason for any form of education was the advantage it brought to the faith" (Boyd 100). Capella's pagan expression of all secular knowledge in seven arts was not fully integrated into the newly Christianized Rome until the Sixth Century, when Cassiodorus, a former statesmen who established several monasteries, sanctified the Seven Liberal Arts by connecting them to the Biblical edict found in Proverbs 9:1, which states "Wisdom hath builded her house, she hath hewn out her seven pillars" (Boyd 103). Having abandoned their pagan promiscuity, scholars could now study the newly chaste liberal arts in correlation with Scripture so long as the content could be discerned in the roots of Christianity (Wilson 22). This union cemented the seven arts as a standard part of education and remained largely unchallenged in England until the Victorian period (Boyd 103).

The indoctrination of religious principles into English education was at its strongest during the Reformation when the authority in education was passed from State to Church (Boyd 183). Despite the protests of the Anglican Church in England, Puritan principles governed Oxford and Cambridge through the end of the Reformation in the sixteenth century; the influence of Puritanism still remained after the Anglican Church regained control of education thereafter (Boyd 200). By the first decade of the nineteenth century, France and Germany had begun to set the precedent of State governed education, both countries having established a national system of public education by 1806 (Boyd 359). Germany sought to harness the strength of individual citizens through a humanistic foundation of public education, while France attempted to make its citizens subservient through State controlled education (Boyd 359-360). As a result of upper-class antagonism towards public education, England took neither approach and instead was content to allow education to continue on a voluntary basis managed primarily by the Church with no intervention from the State (Boyd 367). This elite antagonism was rooted in the fear of public education as a breeding ground for social unrest as evidenced by the working class radicals who called for a State supported education system (Boyd 367).

The first instance of the English State's involvement in education came with the passage of the first Factory Act in 1802, the Health and Morals of Apprentices Act, which stipulated that apprentices were to be educated every working day in reading, writing, and arithmetic for the first four years of their apprenticeship (Boyd 368). This mandate, while it applied to a very small portion of working class children and was not strongly enforced by the government, nevertheless established the first precedent for Parliament's involvement in education, even though ultimately it offered no improvements for the educational plight of

the working classes (Boyd 368). The pressure for government to provide for the education of working class children was not the result of a desire to enhance the intellectual capabilities of the people, as in Germany, but rather to alleviate the poor working conditions in the industrial factories and mills (Boyd 367). Social philanthropists fought for better working conditions for the poor and believed this goal could only be achieved through education (Boyd 367). Middle class factory and mill owners strongly resisted this idea and believed that their increasing wealth depended on the oppression of the working class through harsh labor conditions to prevent them from attempting to work their way up in the factory system (Boyd 368).

In 1812, educational reformer Robert Owen promoted an idea contrary to the existing system, claiming instead that with the proper environment and education, workers could be molded into a peaceful and harmonious class with no negative consequence for middle class profits (Donnachie 45). The key was to provide an environment of "rational instruction" to "inculcate sound sentiments and manners," which would ultimately result in a happy and productive working class (Donnachie 46). Owen's main point was that "character is in no way dependent on the individual but is wholly formed by external circumstances, apart from the will, and that consequently the difference between good men and bad resolves itself into a difference of education" (Boyd 369). He essentially argued that a nation could control its own destiny through education and believed that it was the responsibility of the government to develop a national system of education to foster a happier working class environment, which would ultimately result in a more stable social structure (Boyd 369). Owen's views on the creation of a conforming underclass appealed generally to the governing elite, but no

attempts to implement his ideas in factories other than his own at New Lanark succeeded (Donnachie 48).

Just prior to Owen's campaign to educate the poor, Samuel Whitbread had proposed a bill in 1807 calling for a national system of schools and mandating that poor children receive two years of free education; the bill was defeated on the grounds that educating the poor would be "prejudicial to their morals and happiness; it would teach them to despise their lot in life" and "enable them to read seditious pamphlets, vicious books, and publications against Christianity" (qtd. in Brantlinger 68). The consensus of thought in Parliament was not that educating the working poor would result in a happy conformist class but rather that education would enlighten them to their miserable state and incite rebellion and heresy in an attempt to wrest power from the ruling class. Herbert Spencer also argued against a national system of education, but not for the reasons put forth in Parliament. Unlike Owen, who placed an emphasis on education through the cultivation of community, Spencer believed that education was purely an individual matter and State involvement in education should be minimal if undertaken at all (Boyd 371). Spencer's educational philosophy, which will be discussed in more detail in Chapter 3 in relation to the education debate, was based upon his belief that the purpose of education was to prepare one for "complete living" and that social interests constructed by government involvement interfered with rather than supported that endeavor, as seen in the rejection of Whitbread's bill (Boyd 371). Regardless of the growing pressure to establish a national system of education, government did little to support education in the thirty years between the passage of the first Factory Act and the First Reform Bill of 1832.

The First Reform Bill was the first step towards the erosion of the longstanding aristocratic upper class political monopoly by diffusing power from the Lords to the middle classes. The bill enfranchised all males owning a household of at least £10 and tenant farmers of at least £50 and thus increased the size of the electorate by nearly 50 percent (Farrell). However, despite serious concerns, the reformed Parliament that met in 1833 was largely unchanged and lacked the anticipated rise in mercantile members (Farrell). Nevertheless, there was still a justified cause for concern as "the popular instinct rightly divined that a new era had dawned...the middle class might not be in office, but it was in power, and it only needed time to make that power effective" (Wingfield-Stratford 104). The problem for the ruling class was that it had no faith in the capacity of the middle class to properly wield its newly found political power and did not understand the concept of a developing society (Evans 50). Consequently, the ruling class was concerned as to the manner in which the middle classes were to be educated. It would be in the best interests of the upper class to educate the rising middle class in the classical manner that had facilitated the continuation of the traditional social hierarchy. However, the private liberal education that had shaped generations of ruling aristocrats had historically been inaccessible to the middle classes, and the future of England was now in the hands of a "brutal, illiterate mob, without a mind of its own...in no condition to take over the government of the country" (Wingfield-Stratford 103). To complicate matters, the First Reform Bill was quickly followed by the passage of another Factory Act in 1833 that made school attendance compulsory for the first time. However, the Act only applied to children between the ages of nine and thirteen, and over the next five years a mere £30,000 was allocated to aid in funding the construction of schoolhouses and

training teachers, clearly revealing the State's extreme reluctance to move towards a national system of education (Boyd 369).

Outside of the public arena, private education was also desperately in need of reform by the 1830s. Rugby and other academies like it had begun to grow lax in the quality of education and their adherence to traditional religious standards with claims that "religion was virtually a dead letter at these schools, despite the fact that most of the teachers were clergymen" and that the schools had become centers of "brutality, rebellion, and sexual vice" (Schlossberg 109). In 1828, Thomas Arnold was appointed headmaster of Rugby and was equally appalled by the lack of religious rigor, as noted two years later in an article published in the *Record,* which claimed that in the past century religion had been "neglected in these institutions, as though the Gospel had never been propagated" (qtd. in Schlossberg 110). The state of education, coupled with the political changes brought forth by the First Reform Bill, left the ruling class in a precarious position, for the social structure of England depended heavily on the class distinction provided by the religious standard of education. Arnold believed that religion should be the central focus of education as it should be in life and proceeded to implement that philosophy in the fourteen years that he served as Rugby headmaster (Schlossberg 110).

Arnold regarded religion as "what the Gospel teaches us to mean by it, it is nothing less than a system directing and influencing our conduct, principles and feelings," and he considered the first purpose of education to be the cultivation of Christian morality (qtd. in Barnett 25). Following this, Arnold insisted that each student have a "high level of Biblical competence" and be able to recite passages of Scripture, their context, audience, and meaning in the original language (Schlossberg 111). He applied the same approach to teaching the

classics and instilled his own moral and spiritual lessons through the ancient authors (Schlossberg 111). Arnold's success in reforming Rugby was extraordinary, and it later became the prototype for the formation of the schools that opened between 1840 and 1900 to cater to the swelling middle classes (Barnett 24). The "new ideal of Christian education" found at Rugby went so far as to influence the universities of Oxford and Cambridge, where the "tone of the young men at the University, whether they came from Winchester, Eton, Rugby, Harrow or wherever else, was universally irreligious" prior to Arnold's widespread reform (Barnett 26). But as Arnold's influence spread, the headmaster of Winchester remarked that "a most singular and striking change has come upon our public schools...This change is undoubtedly part of a general improvement of our generation in respect of purity and reverence" (Barnett 26-27). Still, the English secondary schools and universities alike remained isolated from the physical reality of a changing society and lived in a "closed community" where "the future rulers of England heard their headmaster preaching about honour and service and sin" (Barnett 33).

By 1842, the year of Arnold's death, he had fundamentally changed English education and firmly resettled it in the religious tradition. It has been said that "although [Arnold] had no special love for the Evangelicals, nor they for him," with Arnold "Evangelicalism began its conquest of the public schools" (qtd. in Schlossberg 112). The religious reawakening of education was the most profound consequence of Arnold's tenure at Rugby, and it is the resulting religious conquest of education that upheld the aristocratic claim to power and strengthened the classicists' resistance to an appeal for scientific and technical education in the later part of the nineteenth century (Schlossberg 112). "Like the public schools, the universities were monasteries" far removed from the "clank and smoke

and squalor on which the ease and assurance of British upper-class life depended" (Barnett 38). The sentiment that England's ruling class was "living a sheltered life in the academic world of Oxford, had little or no understanding of the new world racing into existence around them," and was unfit to cope with the challenges brought by the turn of the century went entirely unrealized by the upper classes (Evans 84).

In 1867, the passage of the Second Reform Bill, which effectively doubled the electorate by enfranchising all male landowners, sealed the political fate of the upper class. The political shift initiated by the First Reform Bill was becoming a reality, and the Second Reform Bill proceeded to extend political power even further down the class ladder. The Second Bill was a significant catalyst for government intervention in education as the dilemma of how to educate the middle classes could no longer go unaddressed and "clearly only government could apply the necessary drive" for the modernization of education (Evans 168). In 1870, England finally passed the Education Act and established a national system of elementary education, with each of the newly created school districts to be governed by a school board (Auerbach 64). Additionally, the strict requirement that only members of the Church of England could gain admittance to Oxbridge was removed by the end of the decade and Anglican resistance to the secularization of education was heightened with the belief that it was a "fair and just demand on the part of the Church of England that the governing body in her University and her colleges should be composed of her members" (Evans 167). As the control of education slowly began to shift from the Church to the State, the Universities and their members no longer belonged exclusively to "her."

The most significant consequence of the establishment of a national system of education was the weakening of the religious control of education, allowing for a serious

consideration of scientific education. England trailed far behind most other European countries in education in the arts and sciences "largely owing to the dead weight of tradition and custom under which the whole subject lay buried," and the minor first step of establishing elementary education, unfortunately, did little to resolve larger tensions in education that had been fermenting throughout the period of the Industrial Revolution between proponents for a continued classical education and scientists regarding the future of education (Evans 168). The government's approach to education had "laid down that education was not for use, but for leisure, not for workers, but for gentleman" and "took no account of the workaday world" (Evans 168). While some scholars have suggested that it was the continued dominance of England's landed classes that inhibited the development of any form of technical education, others claim that it was the result of the bourgeois failure to secure reforms in education to promote the industrial development that they supported (Green 126, 128). Regardless of where blame is placed, England's inability "to develop a rigorous, consistent, and modern pattern of education" in the Victorian period was perhaps its greatest failure (Jones 25).

And it is this failure that set the stage for the Education Debate. The ruling class continued to ignore the changes in society brought on by the Industrial Revolution and instead fought to uphold a tradition of gentlemanly training that was becoming increasingly ornamental as England needed to develop a scientific and technical curriculum to remain at the height of industrial power. The religious resistance to pursuing scientific study continually delayed the integration of science curriculum into English schools and universities and resulted in high tensions that came to light following Darwin's first publication of evolutionary theory. The disorganized state of English education was essential

to the emergence of the clash between science and religion as it weakened the once solid place of liberal education in society just in time to face the oncoming Darwinian debate.

CHAPTER II

DARWINIAN CONFLICT IN VICTORIAN CULTURE AND EDUCATION

The Victorian period is marked by the clash between science and religion, and since his publication of *The Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* in 1859, Charles Darwin has been widely attacked by those who adhere to a biblical explanation of the origins of life and equally widely praised by proponents of science. Despite the iconic status of his work, his subsequent influence in education during the Victorian period has gone largely unacknowledged. This is likely because the implications for education were overshadowed by the religious uproar that followed *The Origin of Species* for decades after its initial publication. Darwin's study, and his final synthesis of early evolutionary theory, rivaled Galileo's *Dialogue Concerning the Two Chief World Systems* as one of the most profound and controversial texts in history. By publishing *The Origin of Species,* Darwin "opened the door of a world more glorious than mankind had ever conceived," yet "his incongruous reward was to be condemned from a thousand pulpits as an infidel and a heretic" (Evans 84). Like Galileo, Darwin "revolutionized man's apprehension of himself and his world," which was highly problematic in a society resistant to the slightest change in man's place in the world (Bratchell 7). Darwin laid the foundation for a new view of man's origin upon which the religious tradition inherent in a liberal education could be challenged in order to allow for the development of a scientific direction of study unfettered by religious thought.

At the end of the eighteenth century and early in the nineteenth century, religion and science—by means of Paley's natural theology—had a mutually beneficial alliance; the clergy used scientific "evidence" to support religious views while scientists, who were often also devout, were able to pursue scientific study without consequence so long as it did not fall outside the realm of justification by natural theology (Bratchell 11). Many scientists had no desire to contradict religious beliefs that they themselves adhered to strongly, and so both scientists and non-scientists straddled the line between faith and doubt (Bratchell 11, 13). Paley's highly influential natural theology had been a successful way to resist the scientific encroachment upon faith in the late 18th and early 19th centuries by justifying new discoveries through a Christian lens. Natural theology hinged on Paley's watchmaker analogy which exploited the intricacies of natural design and the fact that no other definitive explanation for the origin of life existed, thereby indicating the existence of an intelligent creator. Darwin himself called the origin of species "that mystery of mysteries" and claimed only to shed light on the matter, not solve the mystery (95).

By the Victorian period, only a few religious naturalists remained who could reconcile Darwin's theory under the guise of natural theology with the claim that "man is subject to natural laws" and the Bible must "bow before the 'Works of God'" (Bratchell 18). This view essentially diminished Biblical authority and ignored the textual contradictions while reinforcing God's authority through newly discovered natural laws. If evolution and natural selection were valid natural phenomena, then natural theology claimed that both must be mechanisms designed by God. Despite the tidy explanation offered by natural theology, the Church was reluctant to sunder God from His Word, and the dominant religious argument was based on the assertion that the Bible was true and voiced by men like Bishop Samuel

Wilberforce, who fought as an "implacable foe of revolutionary ideas" and sought to impair further development of evolutionary theory by discrediting it through revelation of supposed scientific fallacies in Darwin's theory in addition to obvious Biblical contradictions (Thomson 211).Wilberforce supported Paley's belief that "the function of science was to uncover and illustrate the beautiful works of God's hands...not to undermine the evidences of His handiwork," which was what Wilberforce believed Darwin's theory of natural selection did (Hesketh 39). However, Darwin was not the only one to do so. Charles Lyell published his *Principles of Geology* in 1833 and laid the foundation of doubt in the validity of Genesis through his claims that the earth itself provided evidence of having existed much longer than the genealogy of the Bible allowed. The advancement of geology as a scientific field of study acted as an "essential prelude to the Darwinian hypothesis" by weakening the steadfast Victorian belief in the accepted age of the earth, the timeline of man's development, and major events, such as the Biblical flood (Bratchell 14). Theories spanning geology, zoology, astronomy, and evolution were published during the 1830s by Lyell, Herschel, Whewell, and others, none of which had approached Darwin's level of impact. Early publications of scientific theory unfortunately coincided with the movement to reinstate religious principles in education and lacked the scientific rigor and foundation of doubt that were essential for Darwin's theory of natural selection to take root in Victorian thought.

Opponents of Darwin's ideas claimed that his theory of natural selection was not based in "facts of nature" but rather "the idle play of fancy" which rendered man "incompatible with the whole representation of that moral and spiritual condition of men which is [Scripture's] proper subject matter" (Willey 56). The challenge to man's spiritual condition was strongly reflected in the literature and poetry of the Victorian period, most

notably that of Alfred Lord Tennyson, the poet laureate of England for most of the Victorian period. Tennyson wrote his defining poem, *In Memoriam*, in the wake of Lyell's geologic theory, and it is the most profound Victorian contemplation of the implications of the natural sciences on a man's personal faith. In the poem Tennyson "expresses his fears about the lack of meaning in an indifferent universe" but is able to reconcile his faith with science through a spiritual connection to God which exists despite scientific progress and religious controversy (Cartwright 3). Tennyson explores the theme of a "directionless universe governed by purposeless mechanical laws" as he attempts to reconcile man's spirit with his arbitrary existence in the universe as proposed by evolution without reverting to Paley's natural theology, revealing the slowly changing relationship between science and religion (Cartwright 4). Tennyson separates the natural and the spiritual by saying "I found Him not in world or sun/Or eagle's wing, or insect's eye,/Nor through the questions men may try,/The pretty cobwebs we have spun" and allows for the possibility that nature exists apart from the divine (124.5-8). Instead of relying on a natural justification for faith, Tennyson turns to man's inner spirit which attests to the existence of God through the simple confession that "I have felt" (124.16). Faith was no longer neatly structured within the accepted order of the universe and now had to be vindicated through individual spiritual experiences.

Darwin's theory of natural selection magnified the societal fear of disordered insignificance which lay at the core of the resistance to evolutionary thought. Similarly, John Ruskin, the leading cultural critic of the Victorian period, was unable to ignore the "dreadful Hammers" of geologists that clinked "at the end of every cadence of the Bible verses," challenging his belief in traditional Christianity (qtd. in Cartwright 6). Religious doubt was widespread in Victorian society decades before Darwin published; Darwin did not trigger the

Victorian crisis of faith but rather provided the strongest source of validation for existing religious doubt. *The Origin of Species* became known as "a symbol of what science was doing to the faith of the Victorians" (Dennis 78). Consequently, evolution is often the scapegoat for the Victorian crisis of faith, but the issue was much larger than Darwin and the natural sciences (Bratchell 13).

By 1859, scientists, the clergy, and the general English populace widely accepted the principle of evolution, and while Darwin's own research certainly expanded and solidified aspects of evolutionary theory, much of the significance of *The Origin of Species* lay in his willingness to face the consequences of publication knowing that he "set himself single-handedly against the massive forces of conventional scientific and religious opinion, both of which were committed to the ancient and sanctified belief in the fixity of species" (Appleman 5). Darwin's greatest challenge to established religion lay in the idea that the universe was self-regulating through natural selection and not operated by a deity (Appleman 14). The theory of evolution had been developing for more than a century before Darwin through the work of men such as Jean Baptiste Lamarck, Carl Linnaeus, Alfred Russel Wallace, and Darwin's own grandfather Erasmus Darwin, but a reluctance to disturb the precarious relationship between science and religion prevailed and few serious attempts were made to promote evolution. However, upon its publication *The Origin of Species* "acted as a catalyst" for evolutionary theory "on an unprecedented scale, because...it aroused serious scientific opinion and provoked theological and philosophical reaction" (Bratchell 73). The tensions between science and religion had been developing since Copernicus first suggested that the earth was not the center of the solar system, but it was not until Darwin that this disharmony rose to the surface to be addressed in the public arena.

The philosophical reaction to *The Origin of Species* was one of the key aspects of the push to provide for science in Victorian education. Science was largely neglected in education in 1859 due to the rigid tradition of classical education discussed earlier and a general lack of consideration for the implications of science (Annan 31-32). Science at Oxford was in a perilous state throughout the first half of the nineteenth century as continued attempts to establish a School of Natural Sciences were repeatedly rejected on the grounds that it was too "alien from what is thought to be the proper business of the University as natural history in any of its branches" (qtd. in Thomson 210). This "proper business" had historically been the cultivation of morally upright gentleman, and the ruling classes considered science, under suspicion of being morally dangerous, to have no place in formal education (Annan 32). As a result, scientific study was scattered and disorganized, lacking structure, and unrepresented by any professional body of thought, as "the distinction between scientist and non-scientist had not established [any] clear lines of demarcation" (Bratchell 13, 47). Scientists of the time were still amateurs and men of all backgrounds and professions, including physicians, lawyers, and clergymen, but they were becoming increasingly frustrated with the lack of formal recognition of their studies at the hands of a purely liberal education (Bratchell 13).

However, as technology continued to progress, the importance of science to innovation became increasingly obvious. The educated population was thus more aware than ever of the "importance of new fields of knowledge, while the uneducated were more aware of the technological changes which undoubtedly affected their way of life than of any scientific theories which might alter their fundamental beliefs" (Bratchell 14). The Victorians were fascinated with science in its application to technology but less interested in its attempt

to understand the natural world because "what was at stake was no less than a worldview" (Appleman 7). Despite the thrill of railroads and steam engines, the scientific community had little support from the general public in its academic endeavor to become recognized as a fully legitimized discipline of study. The degree of apathy regarding education in the industrial sector was the direct result of England's lethargic development of a broader national education system as well as the Victorian resistance to an alteration of religious thought which was a consequence of the successful religious indoctrination of England for centuries.

Oddly, the scientific validity of *The Origin of Species* seemed of relatively little concern in the education debate that followed its publication. What was of utmost concern was Darwin's claim that man evolved independently of a controlling deity combined with the idea that "chance begot order in the world" (Annan 35). If this were true then the religious principles that served as the foundation of Victorian society were at risk of being displaced by humanistic interpretations of man's place in the world. Since the Victorian social hierarchy was held in place by an acceptance of the notion that a man's lot in life was the direct will of God, any efforts to circumvent God's will were considered not only futile but also dangerous. The tradition of education in England served this notion by providing the upper class with the religiously based liberal education necessary to continue their political and social rule while the middle and lower classes received the degree and type of education necessary to allow them to perform their social functions. Darwin's suggestion that one's existence was a consequence of chaos rather than an overarching divine purpose allowed for the possibility of a new social structure which did not depend upon religious validation. While Darwin himself did not actively attack religious doctrine or seek to supplant Victorian

social traditions, his text was essentially the greatest weapon used to champion these ends by many of his followers, most notably Thomas Henry Huxley, who was one of the key voices in the Education Debate. Darwin legitimized the pursuit of science as an independent discipline and gave scientists a voice in the curriculum debate that had begun to emerge in academia.

As the 19th century progressed, science began to reshape the character of theology and subsequently the tradition of Christianity in England, which inevitably required a reevaluation of education and its aim in society (Annan 42). This reevaluation included the creation of distinct disciplines to accommodate new directions of study. Prior to the Victorian period there was an "implicit assumption that knowledge was a unity" with little consideration for the existence of distinct disciplines (Annan 33). The expansion of scientific discoveries in all directions, however, required the development of an academic discipline that would facilitate the pursuit of understanding the natural world. Since honest scientific study could not thrive within the Biblical boundaries imposed by the Church, its expansion would naturally reallocate much of the religious control of education rooted in classical study to an increasingly agnostic scientific community.

Despite the cultural impact of his work, Darwin was strangely silent on the whirlwind of controversy that *The Origin of Species* generated and remained aloof from most of the debate regarding science and religion, being called the "gentlest of revolutionaries" (Appleman 4). Moreover, Darwin never explicitly supported any particular action regarding the future course of education. But the new direction of scientific thought created by his theory of natural selection was incapable of developing in the traditional model of liberal studies and required that education adapt to the new wave of scientific philosophy. Darwin's

influence in all aspects of Victorian society is truly astounding and a consequence of perfect timing. *The Origin of Species* was published at the convergence of religious doubt, political upheaval (being positioned between the two Reform Acts), and social instability. Darwin exposed the crucial need to educate the middle classes in science and technology in order for England to remain the global leader in progressive development and illuminated the precarious social position of the ruling class. The Victorian social hierarchy was supported by traditional religious principles, and as man's place in the universe was questioned, so was man's place in society. The Victorians grappled with the multi-faceted implications of *The Origin of Species* and were forced to confront the irreconcilability of Biblical faith and scientific discovery that had lain buried since the advent of man's attempt to explain the natural order of the universe.

CHAPTER III

THE CLIMAX OF THE EDUCATION DEBATE: ARNOLD AND HUXLEY

A classic liberal education which descended from the belief that "the order that is found in language, music and mathematics is a reflection of the perfect order that exists in God" had been the foundation of education in England for centuries (qtd. in Grant 198). But with the rise of a national system of education in 1870 and an overwhelming demand for scientific education following Darwin's publication of *The Origin of Species* in 1859, the clerical monopoly on education had slowly begun to wane. This provided the opportunity for scientists to make a case for the inclusion of scientific study as a distinct branch of education, not subservient to the religious interests of the liberal arts. In medieval education, scientific study was encapsulated within mathematics as the mechanism for unlocking nature's secrets, and there was no real distinction between "liberal" and "scientific" education; all branches of study coexisted within the framework of education, which served to cultivate knowledge in every aspect of life (Grant 199). By the Victorian period this unified approach to education was no longer possible, since significant scientific and technological advances were being made that warranted the need for an alternative method of education. In light of biological discoveries, though, and led by Darwin's theory of evolution, scientists now argued that it was science, and not the liberal arts, that should serve as the foundation of education in the future.

The debate initially began with an appeal for the formal development of scientific education because "it dealt with such an enormous portion of the totality of human

knowledge," but the fervor with which scientists like Huxley attacked the traditional model of education revealed a deeper motive of displacing the liberal arts as the dominant branch of knowledge rather than peacefully merging the two approaches to form a new academic structure (DeBoer 9). Because the liberal education of the upper class had failed to extend to the rising middle class and because the liberal arts failed to account for new discoveries in the physical and natural sciences, scientists viewed liberal study as an increasingly outdated system of thought and proposed instead to educate the masses in practical ways that did more than preserve an archaic class structure. Proponents of science education claimed that a classical education promoted a "passive acceptance of authority" and proposed in its place the active pursuit of knowledge in a new and different way (DeBoer 3). Classicists countered that the intellectual merit of traditional study did much to preserve the foundation of thought and reason in society (DeBoer 11). The debate included conflicting definitions of the true purpose of education; scientists felt that education should "prepare people to deal with…socially relevant questions" through practical applications, while classicists held that education should strengthen a person's mental faculty and cultivate the ability to think adaptively across a broad spectrum of ideas rather than focusing on a narrow set of issues (DeBoer 3, 11). This divide led to the famous Arnold-Huxley Debate, the series of exchanges between Matthew Arnold and Thomas Henry Huxley that lasted for approximately four years beginning in 1879 and embodied the core of the controversy in education at the time.

It is fitting that Matthew Arnold was known as a "champion of the Humanities," since he was the son of famed educational reformer Thomas Arnold (Roos 317). Matthew Arnold was a school inspector and poet who turned his attention to the defense of the liberal arts and traditional culture towards the end of his career. Despite being a close personal friend of

Arnold's, Thomas Henry Huxley led the scientific community in its charge against the classic liberal education and was nicknamed "Darwin's bulldog" for his aggressive promotion of Darwin's theories. Interestingly, neither Arnold nor Huxley argued for the exclusivity of the liberal arts or science in education and, in fact, both advocated the moral and intellectual value of education. However, they both firmly held that one branch and not the other was best suited to serve as the pivotal foundation of education. Their disagreement was even more fundamental than conflicting beliefs as to which direction of study was more relevant in their rapidly evolving society; at its core, the debate was over irreconcilable differences between religious faith and science. Arnold, although he had no personal belief in the Christian faith, argued that religion was the essential framework within which culture could exist and continue to develop; Huxley, who coined the term "agnostic" in 1869, adamantly rejected the religious authority inherent in a liberal education and promoted a purely secular education environment (Dowe 104).

As a study of their essays on the subject reveals, Arnold and Huxley acknowledged the need for both types of education as "an exclusively scientific training will bring about a mental twist as surely as an exclusively literary training" (Huxley 1435). Arnold and Huxley were also in agreement that Greek and Latin, which Huxley viewed as tools of theological control, were not essential components of every student's education and both signed a petition to end compulsory exams in Greek at Cambridge in 1878 (Roos 316-317). Shortly after this display of uniformity, however, Arnold realized that he must shift his position to more strongly defend the liberal arts for fear of an imbalance in light of growing success among the sciences (Roos 317). Arnold thus reemphasized the "moral dimensions of education which he thought modern science ignored" at a speech at Eton in 1879, marking

the beginning of the Arnold-Huxley Debate (Roos 317). At the outset of the debate neither Huxley nor Arnold directly challenged the other in name, but Huxley took an opportunity to indirectly respond to Arnold in "Science and Culture," a lecture delivered at Sir Josiah Mason's Science College the following year, during which he referenced "the writings of our chief apostle of culture," obviously meaning Arnold (Huxley 1431). In his speech, Huxley stated that "neither the discipline nor the subject matter of classical education is of such direct value to the student of physical science as to justify the expenditure of valuable time" and that "for the purpose of attaining real culture, an exclusively scientific education is at least as effectual as an exclusively literary education" (1431). Huxley equated the cultural value of a scientific education with that of a liberal education and saw no reason to prefer the liberal education, which provided no practical benefits, over a scientific education, which had numerous practical applications. The most notable application was to industrialization, and Huxley believed that scientific education was an essential component of industrial progress (1430). Furthermore, Huxley felt that mankind's theory of life was influenced by natural knowledge and conceptions of the universe, an influence which had been unconscious throughout most of history and was now being consciously realized (1434).

Huxley regards the historical theory of life as the natural result of a lack of natural knowledge and the traditional correlation of "culture" with "saintliness" a product of Western isolation prior to the spread of civilization, in part through the Crusades (1433). With the steady growth of "new knowledge," Huxley claims that it is no longer possible to find truth in words, as Arnold believes, and truth must now be sought among the things of the natural world (1434). In *The Function of Criticism at the Present Time,* Arnold defined culture as knowing "the best that has been thought and said in the world," a broad perspective directly

contrasting the focused nature of scientific study (1396). Huxley suggested that Arnold's definition of culture pertained principally to literature and philosophy; yet, because literature and philosophy could never represent the whole existence of man, they could not possibly answer to the educational needs of an increasingly industrialized scientific and technological world (Huxley 1431). Arnold could not ignore this direct challenge to the value of a liberal education and his own cultural philosophy, sending Huxley a letter in which he stated that "knowing 'the best that has been known and said in the world' was meant to include knowing what has been said in science and art as well as letters" (qtd. in Roos 318). However, Arnold's synthesis of the best of literary thought to preserve "culture" for future generations was complicated by Darwin's publishing of *The Origin of Species* and other works because as controversial scientific texts were becoming a part of all that was known, poets and scholars were now feeling pressure to reconcile the ideas therein for the sake of culture. Arnold sought a way out of this impasse by arguing that *literature* should be understood to mean "all knowledge that reaches us through books" containing "the materials which suffice for thus making us know ourselves and the world" and thus accused Huxley of having too narrow a view of the scope of a liberal education (Arnold 1417). Huxley acknowledged that whole "culture certainly means something quite different from learning or technical skill," and he in turn defined culture as "the possession of an ideal" which supplies "a complete theory of life, based upon a clear knowledge alike of its possibilities and of its limitations (Huxley 1431). On the surface it appears, therefore, that Huxley and Arnold's definitions of culture were nearly identical. But upon closer examination it can be seen that an essential difference exists; Arnold believed literature was enough to supply the knowledge necessary

for a complete theory of life while Huxley heralded "reason as the sole guide to truth" (Huxley 1433).

In 1881, one year after Huxley delivered "Science and Culture," Arnold was invited to give the toast to Literature at the Royal Academy of Arts and was introduced as "a seeker after light, the foe of all Philistines" (qtd. in Roos 319). In his toast Arnold distinguishes Literature as "facultative" and Science as "obligatory," a younger sibling of Art and Literature, newly born and "now so full of promise and pride" yet knowing nothing of the struggle required to prevail over time (qtd. in Roos 319). Arnold boldly claims that Literature and Science "are in the same boat" and that "if we are not necessary, you are not necessary" (qtd. in Roos 319). Arnold's speech had a much more conciliatory, almost dismal, tone than Huxley's and emphasized the "indestructible bond of sympathy in the common experience" of artists and men of letters (qtd. in Roos 319). Arnold essentially claimed that the liberal arts would continue to prevail as they always had through the anxious struggle that they had long endured, of which their little sister Science knew nothing yet.

The next year Arnold openly named Huxley as his opponent in a lecture titled "Literature and Science" delivered at Rede and later published as an essay in 1883. In the essay, Arnold elaborates his thoughts on education, science, religion, and literature, his fullest articulation of his "peculiar Christian, humanistic vision" (Roos 320). Arnold opens by addressing the claim that it is absurd to inflict a classical education upon "an industrious modern community" as well as the suggestion that "the predominance [in education] ought not now to pass from letters to science" in order to meet the demands of modern life (1416). He answers these claims by appealing to the "constitution of human nature," which he feels scientists have overlooked in their obsession with facts (1420). The factual "pieces of

knowledge" that men gather lead them to follow their "instinct for intellect and knowledge" in a "desire to relate these pieces of knowledge to our sense for conduct, to our sense for beauty" and therein lies the "strength of that hold which letters have upon us" (1420-1421). Arnold makes his case on a fundamental assumption about human nature—that men will always revert to a tendency to connect natural knowledge with the human experience through thought and emotion in relation to principles (1421). For his part, Darwin once confessed that he "did not experience the necessity for two things which most men find so necessary to them—religion and poetry," upon which Arnold commented, "To a born naturalist, I can well understand that this should seem so. So absorbing is his occupation with nature, so strong his love for his occupation" (1422-1423). Arnold accepted Darwin's cultural apathy with the admonition that "Darwins are extremely rare," and he acknowledges that some anomalous men will simply lack that instinct that drives them to seek beauty, but he nevertheless asserts that it is not a great enough phenomenon to warrant altering the entire course of education to accommodate the unfeeling pursuits of a few men (Arnold 1423).

Arnold also states, "the student of humane letters only, will, at least, know also the great general conceptions brought in by modern physical science...but the student of the natural sciences only, will, by our very hypothesis, know nothing of humane letters" (1425). His fundamental claim is that the study of literature encompasses all knowledge and provides the foundation of liberal thought while the study of science focuses on a narrow aspect of life isolated from man's instinctual tendencies. Arnold challenges the value of knowing scientific facts in *Literature and Science* by presenting an example of a student who understood the line from *Macbeth*, "Can'st thou not minister to a mind diseased?," to mean "Can you not wait upon the lunatic?" (1425). Arnold then questions whether it would be worse that the

student not know the moon's diameter or not be able to produce an intelligent interpretation of poetry and ultimately claims that the student's ignorance of the moon's diameter is of little consequence while the student's lack of intellectual abilities, as evidenced by his poor understanding of poetry, has much greater consequences that extend to his ability to manage his affairs in society (1425). Arnold's understanding of science was evidently naïve and simplistic, and his appreciation for scientific discoveries extended only as far as they could be applied to man's need for beauty (1424).

In 1883, Huxley was asked to deliver the toast to Science at the same Royal Academy of Arts banquet that Arnold spoke at two years prior. In his address, Huxley presents art and science as complementary expressions of "the eternal order of things," one "in terms of feeling, the other in terms of thought" and claims bluntly that "I am unable to understand how any one with a knowledge of mankind can imagine that the growth of science can threaten the development of art in any of its forms" (qtd. in Roos 321). He closes with the observation that "science may have the world to itself" when "men no longer love or hate...and the awe has vanished;" however, this will not be because "the monster has devoured art, but because one side of human nature is dead" (qtd. in Roos 322). Huxley's suggestion is that science will harm no one if left alone and that art will exist as long as human emotion exists (Roos 322). Huxley had one more opportunity to respond to Arnold in 1883 when he delivered the annual Rede lecture on the same day that Arnold was receiving his honorary degree, but despite expectations of confrontation, Huxley delivered his lecture with no direct reference to Arnold or further challenge to the liberal arts (Roos 323).

This marked the end of the Arnold-Huxley debate, which had taken a sinusoidal journey to an unfulfilling resolution. Both had fought for a balanced education and mutual

acceptance of the value of science and the liberal arts yet remained at an impasse regarding the means by which to accomplish this. Arnold's insistence that the Scriptures along with Latin and Greek, Huxley's despised languages, would continue to be studied because they "so deeply engaged men's hearts" as part of an "instinct of self-preservation in humanity" could not be reconciled with Huxley's agnostic demand that education be free of religious influence (Arnold 1423, 1426). While the Education Debate is nicely summarized in the exchanges between Arnold and Huxley, it is worthwhile to also note the earlier educational philosophies of Cardinal John Henry Newman and Herbert Spencer, which Arnold and Huxley later paralleled.

Cardinal Newman's fundamental views on the purpose of education were mostly unaffected by the religious challenge posed by Darwin, and thus he stands as a prime example of the clergy's ability to accept Darwinian theory yet still reject the advancement of scientific education. In *The Idea of a University*, Newman states, "Knowledge is called by the name of Science...when impregnated by Reason" and identifies two avenues of education: Useful, whose end is to be mechanical and "exhausted upon what is particular and external," and Liberal, whose end is to be philosophical and "rises towards general ideas" (1035). He goes on to say, "When I speak of Knowledge, I mean something intellectual, something which grasps what it perceives through the senses" and "as it tends more and more to be particular, ceases to be Knowledge" (1035-1036). Newman strongly opposed the development of scientific education, believing it forfeited true intellectual development in favor of the mastery of a narrow range of tasks. Arnold and Huxley argued primarily about the basis of educational theory and less about the specifics of a university's role in facilitating education. Newman, on the other hand, stresses that a university is more "a place

of education than of instruction" for "education is a higher word; it implies an action upon our mental nature, and the formation of character...in connection with religion and virtue" (1036).

Newman's views on the moral functions of a university align strongly with those of George Turnbull, a Scottish education reformer, who published his philosophy a century before Newman. In *Observations upon Liberal Education*, Turnbull asserts that "Instruction in the science or art of right living is the chief lesson in education" (171). This is echoed by Newman's claim that a university "aims at raising the intellectual tone of society, at cultivating the public mind, at purifying the national taste, at supplying true principles to popular enthusiasm and fixed aims to popular aspiration" (1040). Both Turnbull and Newman grant education the authority to instruct society in the proper manner of living; however, what is inherently problematic in this is the matter of who has the right to wield this authority and define the morality of society. Arnold and Newman both believe that religion is the responsible institution, but Huxley rejects religious authority and proposes to replace it with scientific reason as the guiding light.

Herbert Spencer supports Huxley's stance in his extreme adherence to a purely scientific motive in education. Spencer published four essays between 1854 and 1859 in which he outlined his defense of science as the only meaningful course of education. Like Newman, Spencer believed that "to prepare us for complete living is the function which education has to discharge" (31). Contrary to Newman, however, Spencer defined "complete living" as the facilitation of self-preservation rather than moral completeness. Newman's Useful education, which he ultimately disregards as having no place in a university, is the pinnacle of Spencer's philosophy, which supports instruction in objects and not ideas

(Cordasco v). Spencer's primary writings focus mostly on his development of social evolutionary theory, and he constructs his definition of the purpose of education in keeping with his scientific beliefs, arguing only for practical considerations in education; what has no practical use for man's daily betterment of himself and society has no place in education (Cordasco v).

Spencer also argued against education reform and State involvement, believing that man ultimately had no control over his social evolution and that education was an individual matter only hampered by government regulation (Cordasco v). Spencer's view on the purpose of education was primal, serving only to allow man to survive by inculcating the knowledge necessary to maintain a livelihood (Spencer 43-44). Consequently, "the births, deaths, and marriages of kings, and other like historic trivialities, are committed to memory, not because of any direct benefits that can possibly result from knowing them; but because society considers them parts of a good education—because the absence of such knowledge may bring the contempt of others" (Spencer 24-25). Here Spencer accurately identifies education as a marker of class but disregards the emotional instincts of man which Arnold so fiercely defends as the main reason for the continued study of the liberal arts. Spencer's arguments essentially reduce education to a means of sharpening man's survival instincts with no other social value. Huxley and Spencer agree in their belief that reason should be the supreme authority in education, but Spencer's limitations on education are much more stringent. Huxley acknowledges the value of the liberal arts and is indifferent to their existence, while Spencer sees no merit in any aspect of liberal study. Newman and Spencer thus represent the extreme limits of the arguments made by Arnold and Huxley.

As with any complex issue, there are a myriad of approaches one can take to make sense of the seemingly irreconcilable conflict between Victorian classicists and scientists. Obviously there was a lack of agreement on the basic purpose of education and the function of a university, but had an agreeable compromise been reached, the issue of whether the liberal arts or the sciences better served an increasingly industrial society with a slowly disintegrating aristocracy would still remain. Had the liberal arts and sciences amicably merged into a partnership of sorts regarding the intellectual guidance of society, the question of how to reconcile polarized religious beliefs would then have had to be addressed, and, in light of man's tendency to divergent ideas, it is unlikely that a satisfactory answer could have been devised in any case.

CONCLUSION

The Victorian period is one of incredible complexity and stands as a fascinating intersection of controversial issues. The unusual symbiosis of England's poor educational development and a growing sense of religious doubt, coupled with Darwin's timely publication of evolutionary theory, set the stage for the culmination of the education debate as expressed by the arguments of Arnold and Huxley. The upper class's determination to retain political power and its reluctance to develop an appropriate system of education for the middle and lower classes created a sense of social discontent and opposition that slowly seeped into every aspect of late Victorian society and eventually sealed the fate of the upper class with the passage of the Reform Acts and the weakening of the religious influence in education. As the middle class began to rise in political power, there was no loyalty to the harsh divisiveness of the Victorian social hierarchy, and the upper class was left to fight against its own demise through attempts to maintain the liberal tradition of education that had for so long validated their position as the elite ruling class.

Darwin's evolutionary theory did much to incite Victorian scientists to fight for their place in academia and challenge the overwhelming dominance of Church authority in Victorian education. A history of blind acceptance was being questioned in light of new possibilities for man's relationship with nature. And it was these new possibilities that challenged the old approach to the cultivation of intellect, which was the historical purpose of education. While Arnold believed religious principles were necessary to maintain an orderly society, he, and other classicists, made strong arguments for the continued study of

the liberal arts as a product of man's emotional instincts and not just a fulfillment of religious expectations. Huxley and the consortium of emerging scientists reinvoked the Greek dedication to the pursuit of knowledge through reason and demanded a setting within which to do so free of religious control. Scientific discoveries challenged the validity of religion as the foundation of society's moral guidance, entangling education in the clash between science and faith. Medieval philosophers relied on the union of all knowledge to unlock nature's secrets, while Victorian scientists believed a true understanding of nature could only be achieved through meticulous observation and in the absence of the religious authority ingrained in the liberal arts. God's control and creation of mankind was questioned, as was the Biblical authority that ordained the longstanding social hierarchy. The tension in Victorian education was the result of an irreconcilable struggle between Christian theology and scientific theory brought to light by the religious antagonism towards Darwin's theory of natural selection. The arguments made by Matthew Arnold and Thomas Henry Huxley in defense of the liberal arts and the sciences revealed that, on the surface, the two approaches to education were interdependent and capable of coexisting in a unified curriculum. However, the conflicting religious philosophies at the core of the two systems were irreconcilable and resulted in the development of a schism between the liberal arts and the sciences that continued as a polarized debate into the twentieth century.

In 1959, exactly one century after *The Origin of Species* was published, C. P. Snow delivered the Rede lecture in which he articulated the two sides of the debate as "two cultures," one scientific and one traditional, with a "gulf of mutual incomprehension" between them (4). In *The Two Cultures and the Scientific Revolution,* Snow defines the

scientific culture as an anthropological one that cuts through religion, politics, and class, lacking in knowledge of literature and the arts as a consequence of their irrelevance while the traditional culture is content to contemplate literature and philosophy in the classical manner and pretend that the natural order does not exist (10, 14-15). He contends, however, that scientists are not uncultured for their lack of literary knowledge; they are simply not traditionally cultured (Snow 15). His description of the "curious distorted image" that each side has of the other reflects the misunderstandings between Arnold and Huxley that often obscured their unified stance on an issue (Snow 4). Both cultures are blinded by their own pursuits and hindered by their unwillingness to meet the other in the middle. Snow claims that the chasm between scientists and non-scientists has only grown less "bridgeable" since its development in the nineteenth century, and the hostility between the liberal arts and sciences in modern American education attests to the continued conflict (19). The extreme polarity of the fundamental issues of the education debate indicates that it will continue on beyond our own generation, perhaps forever if it is as Snow says, "There seems then to be no place where the cultures meet" (17).

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